

NOTES ON NEED FOR SUBSURFACE PLUGS  
IN THE LISBON SHAFTS

*Please stamp  
in 6/2/80  
and fill*

I feel that it is unnecessary to place subsurface plugs in either of the shafts as part of the mine reclamation plan at Lisbon Mine.

The Lisbon Mine is serviced by two, 18' diameter, vertical shafts from surface to the haulage level, 2,500 feet below. The haulage level is the only opening to these shafts below surface. At no place, do the ore workings enter the shaft.

Each shaft is lined with a nominal 12 inch thick, poured concrete wall. When the shaft passed through known water bearing strata, the wall thickness was increased to 18 inches and 24 inches. The shafts are, therefore, the equivalent of cased holes, with sealing between the casing and the hole wall.

The haulage level connects both shafts at the 2,500 foot depth running through the Cutler formation approximately 90 feet below the ore bearing Mossback-Chinle member. Access to the ore horizon is made via inclined and vertical headings driven in waste.

Water enters the mine to the haulage level from various breccia pipes and faults within the mine. These faults and pipes intersect both the ore horizon and the aquifers and have for millions of years. The water is collected in sumps and impounded behind dams prior to pumping to surface. Approximately 800 gallons per minute is pumped to surface. Assays of uranium content of this water show 0.59 parts per million, which is well below N.P.D.E.S. maximum of 2.0 ppm.

When mining ceases and the pumps are removed, water will fill the shaft bottoms, spread onto the haulage level and build up behind containment dams, eventually rising into the ore workings, until such time as that space is filled or to the point where the air compressed by the rising water will prevent the water from entering the ore horizon. It will then rise in the shafts until the general water table elevation is reached, and then it will stabilize. No water will exit the shaft to any of the formations because of the concrete lining of the shafts and no pressure differential. There will be no migration of uranium up the shafts, but if there were, it would be contained within the cased shaft.

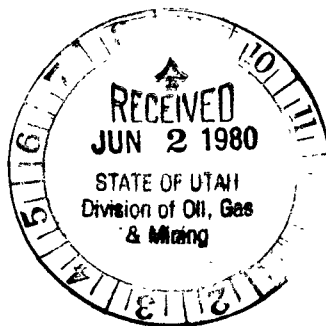
An operation in Canada, at the Stanleigh Mine, has been de-watering a 3,000 foot shaft. Water is being pumped out at 900 gallons per minute since last September. The uranium value in this water which has been in a mine flooded for almost 20 years, still only shows a value of uranium of .7 parts per million, well below environmental regulatory levels. This pumping is actually pulling water out of the ore workings.

In Lisbon Mine's case, when we allow the shafts to flood, we are not pulling water which has been in contact with uranium ore for any length of time.

As a further barrier to movement of water containing uranium, our haulage level does have flood doors which may be closed to prevent the flooding of some areas.

I feel that subsurface plugs are totally unnecessary. They will not add to the present controls to eliminate water from the mine entering the aquifers. In addition, there are, and have been, other travel paths between the ore horizon and the aquifers; e.g. breccia pipes, small faults and the main Lisbon fault. The water currently entering the mine comes originally from the aquifers and once the levels in the present openings stabilize themselves at the aquifer or water table horizon, there will be no flow one way or the other. The surface caps as showing on attached drawings are all that should be required.

  
T. R. Sullivan  
Chief Engineer



ACT/037/001A

PROPOSAL - SURFACE CAPPING OF SHAFTS

Vent Shaft

Install reinforced concrete pad supported by 12" WF 31 steel beams. Include 6" capped pipe inspection window. Grade with well compacted fill.

Cost

Concrete - 7½ yds. @ 60.00 yd.	\$ 450.00
Reinforcing - 457 lbs. #4 bar @ .30¢ lb.	137.10
12" WF 31 Steel Beams, 2232 lbs. @ .30¢	669.60
Labor, 4 men, 16 hours @ 10.00 hr.	640.00
Grading, 10 hrs. Bulldozer @ 80.00 hr.	800.00

TOTAL \$2,696.70

Production Shaft

Install reinforced concrete pad supported by 12" I 31 beams. Include 6" capped pipe for inspection window. Pad to be installed at line of sub-collar.

Fill to level of main collar with spoil and grade with well compacted fill.

Cost

Concrete - 16 yds. @ 60.00 yd.	\$ 960.00
Reinforcing - 692 lbs. @ .30¢ lb.	207.60
12" I 31 Steel Beams, 6200 lbs. @ .30¢	1,860.00
Labor, 4 men, 32 hours @ 10.00 hr.	1,280.00
Site Grading, 30 hrs. Bulldozer @ 80.00 hr.	2,400.00
600 yds. fill @ 3.00 yd.	1,800.00

TOTAL \$8,507.60



TOTAL 2 SHAFTS \$11,204.30

10 yrs. @ 13% 26,829.60

TOTAL ESCROW \$38,033.90

MS